AN ASSESSMENT OF THE CONDITION OF INSTRUCTIONAL FACILITIES IN FLORIDA'S COMMUNITY COLLEGES

By

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This study was conducted to gather data and to generate conclusions regarding the condition of facilities in Florida's 28 community colleges. The population for this study included all instructional facilities on campuses of the 28 community colleges in Florida during the 1997-98 academic year. For the purposes of this research, the community colleges in the state of Florida were categorized into three distinct types, based on size. A stratified systematic sample was selected from this population for use in this study. A previously validated survey instrument was mailed to the office of the president for each facility that had been systematically selected at the respective community college. A regression analysis was conducted to determine the relationship between the condition of community college instructional facilities as measured by the Replacement Cost Index (RCI) and age of the facility, level of deferred maintenance, and the percentage of maintenance funding for plant expenditures in Florida. Analyses of variance were conducted to determine the relationship between the conditions of the community college instructional facilities according to the size category, accessibility and adequacy with and without deferred maintenance.

This research was the second study of the condition of the community college instructional facilities to be conducted in the state of Florida. Numerous results were ascertained through this study. The smaller the percentage of maintenance funding for plant expenditures, the poorer the condition of the instructional facilities. Instructional facilities at the small community colleges were in better condition than at the large community colleges. The facilities in the Florida community college system increasingly were not considered accessible or adequate for current and future enrollment. This indicated a need to monitor deferred maintenance and the maintenance of the instructional facilities at Florida community colleges.

It appears, in the state of Florida, that several problems regarding the maintenance of facilities have continued to grow as a result of unfunded mandates. As a result, legislators should review the formulas used to fund these mandates. Legislators may want to review the revenue generating mechanisms as they currently exist. It would appear the revenue stream is not adequate to fund the mandates as they pertain to facilities.

CHAPTER 1
DESCRIPTION OF THE STUDY

Introduction

Historically, education has been one of the largest markets in the construction business throughout the United States. It was believed that the provision of facilities should remain flexible and meet the changing needs of the students and the providers of education (Abramson, 1985). Furthermore, it is projected that higher education enrollment will increase from 13.9 million in 1995 to 16.1 million by the year 2007 (McClenney, 1998). With the expected increase in enrollment and the poor condition of facilities, the country has witnessed an upsurge in expenditures to refurbish the higher education community. Throughout the education community, the buildings and equipment on a college campus are believed to affect the function of the college. Boyer (1989) believed that facilities should be carefully maintained and well-planned for maintenance and upkeep. Facilities were an important aspect of college life when trying to recruit students (Boyer, 1989). Properly maintained facilities were usually tied to a fiscally efficient institution (Boyer, 1989). The quality of the education provided at that institution was directly linked to the quality of the facilities, and the quality of the physical facilities helped determine how students felt about the institution (Boyer, 1989).

As evidenced by the enormous expenditures by state governments around the country, administrators at America's colleges and universities faced a tremendous challenge regarding construction and the maintenance of educational facilities. Colleges and universities experienced the enormous costs of facility renewal and replacement. They faced a $60 billion facility renewal and replacement backlog (National Association of College and University Business Officers [NACUBO], 1991). Additionally, $20 billion of that amount was urgent in need (NACUBO, 1991). Many institutions around the country had exorbitant amounts of deferred maintenance. NACUBO reported that one institution had a $1 billion backlog (1991) for numerous reasons. Higher education had faced an enormous growth rate of both students and educational institutions.

In a study conducted by Agron (1997), the research findings concluded that a total of $202,100,772 was spent on construction at two-year colleges in 1996 alone. This construction included new schools (n=27), additions to existing schools (n=19), and major modernizations or retrofitting projects (n=51). Furthermore, the projected amount of construction to be completed between 1997-1999 was $537,773,002. Of this amount, $395,775,952 was projected for new schools (n=50), $38,814,550 for addition to existing schools (n=17) and $103,182,500 for major modernization or retrofitting projects (n=51).

Student enrollment grew from 2.7 million in the 1950's to 12.5 million in 1990 and was expected to grow to 20 million by 2010 (McClenney, 1998). Additionally, the total number of institutions grew from 1,800 to 3,300 during the same time period. NACUBO (1991) reported that new institutions (primarily two-year institutions) grew at a rate of one every two weeks between 1955 and 1974. The rapid rate of growth was also targeted as the reason for hasty construction, which did not consider longevity and adaptability of facilities (NACUBO, 1991). Many researchers also reported the impact of the regulatory standards changing over the years. Accessibility guidelines, asbestos abatement, fire and safety codes, leaking underground storage tanks, and hazardous waste removal have cost many institutions significant amounts of operation and maintenance (O & M) money.

Lastly, many institutions have faced decreasing funding, a sensitivity to increasing student fees, and increasing costs. These difficulties have escalated and compounded the facilities crisis at higher educational institutions (NACUBO, 1991). In Florida, Palm Beach Junior College was the only public junior college before 1947, and Pensacola Junior College was approved in 1948 (Laws of Florida, 1947). Shortly afterwards, many community/junior colleges were built in the state. As a result, many of the facilities at Florida's 28 community colleges exceed at least 35 years of age. According to F.S. 235.15, Education plant survey (Department of Education, 1990b), each community college in Florida conducted, at least every five years, an educational plant survey. This survey determined whether the facilities were meeting the needs of the students at each community college. The educational plant survey was based on formulas that accounted for square footage and numbers of student work stations compared to the full-time equivalent (FTE) student enrollment to determine if the college had adequate facilities to serve the number of students attending that institution. If the results of the survey established a need for additional facilities, then recommendations were made to the Division of Community Colleges. The Division of Community Colleges synthesized and prioritized all survey reports into a budget request submitted to the Commissioner of Education. The Commissioner submitted this request as part of his/her budget request to the Governor.

Purpose of the Study

The purpose of this study was to identify the condition of Florida's community college instructional facilities and to determine the relationship between the condition of those facilities and age of the facility, level of deferred maintenance, and the percentage of maintenance funding for plant expenditures in Florida. Furthermore, this study was used to determine whether or not differences existed among the condition of those facilities and their levels of deferred maintenance when compared according to the size category of the institution. A further purpose was to determine whether differences existed among the condition of the facilities with regard to adequacy and accessibility. The following research questions were raised:

1. Are there relationships among the conditions of community college instructional facilities and age of the facility, level of deferred maintenance, and the percentage of maintenance funding for plant expenditures in Florida?

2. Are there differences in the conditions of community college instructional facilities when compared by size category of the college?

3. Are there differences in the conditions of community college instructional facilities when compared by size category of the college and adjusted for levels of deferred maintenance?

4. Are there differences between the conditions of community college instructional facilities for accessibility to the facility in terms of complying with the Americans with Disabilities Act (ADA) Accessibility Guidelines and the Florida Accessibility Code for Building Construction?

5. Are there differences between the conditions of community college instructional facilities for accessibility to the facility in terms of complying with the Americans with Disabilities Act (ADA) Accessibility Guidelines and the Florida Accessibility Code for Building Construction, when adjusted for levels of deferred maintenance?

6. Are there differences between the conditions of community college instructional facilities when compared for adequacy of the facilities for current and future enrollment?

7. Are there differences between the conditions of community college instructional facilities when compared for adequacy of the facilities for current and future enrollment and adjusted for levels of deferred maintenance?

Delimitations and Limitations

Delimitations

The following items were the delimitations of this study.

1. This research was limited to community colleges in Florida.

2. Only facilities that were classified as instructional were studied.

3. The condition of any other facilities was not determined in this study.

4. Data in regard to state funding were collected from the Division of Community Colleges.

5. The information pertaining to the adequacy, accessibility, and deferred maintenance was obtained through the use of a survey instrument, which was completed by a facilities officer at each institution.

Limitations

The following items were the limitations of this study.

1. The results of this study may be generalized only to instructional facilities of Florida's community colleges.

2. Information and data were dependent on the accuracy of the records in the Division of Community Colleges.

3. Data obtained through the survey instrument were based on the knowledge, perceptions, and/or estimates made by the individual officials at the respective community colleges.

4. Conditions determined were those existing at the time the survey was completed.

Significance of the Study

Physical facilities represent a large asset in higher education, not only the actual facilities but, also, the amount of money annually placed in the maintenance and operation budgets of institutions of higher education. The National Association of Colleges and University Business Officers (NACUBO) reported the cost for American institutions to replace the facilities to be $300 billion. Capital renewal and replacement needs of U.S. colleges and universities was estimated to be $60 billion. Furthermore, an estimated $20.5 billion of the total $60 billion was for urgent needs of repairs and renovations. In 1988, colleges and universities had deferred $4.00 of needed maintenance for every $1.00 spent, evidence that reinvestment in facilities had not kept pace with the growing need. Additionally, the three most frequently cited priorities for construction and renovations were classrooms, library space, and laboratories (NACUBO, 1991).

The focus of the 1960s was to expand college campuses, almost on a weekly basis. From 1965 to 1970, an average of 76 new institutions were established each year; that was a rate of three every two weeks (Coffield & Gaither, 1976). With this rapid growth rate, a long-range plan for maintenance and operation of these facilities should have been created. However, evidence of long range plans did not surface in the literature. Therefore, many institutions were facing large liabilities regarding the maintenance and operation of their facilities. Coffield and Gaither (1976) suggested that every capital expansion plan should have included a short-term (operating) and long-term (capital) commitment plan.

The literature supported the statement that when enrollments were decreasing, the need to improve, renovate, and maintain the physical infrastructure demanded a continuous capital outlay and/or debt service budget (Wood & Ruch, 1988). Furthermore, other requirements, such as the William-Steiger Occupational Safety and Health Act of 1970 (OSHA) were perhaps the most significant act to impact higher education. This act guarded against unsafe conditions regarding ventilation, illumination, alternate means of egress, and facilities for persons with disabilities (OSHA, 1970). The modernization of facilities, keeping up with technological changes, replacement of obsolete structures, and keeping up with new or upgraded regulations had created a significant backlog in the area of facilities (Camp & Thompson, 1992).

In Florida, significant issues were taking place. The state experienced extraordinary growth. Since 1960, the population in Florida had doubled from about six million to 12 million people. Furthermore, the population continued to grow at a rate of 326,000 new residents per year. A shortfall of revenue also resulted in reduced proceeds in the gross utilities tax that supported the Public Education Capital Outlay (PECO) fund (Curcio, Longstreth, & Rao, 1988). Additionally, the cost of new construction continued to escalate.

As a result of the continued growth in the state of Florida, the shortfall of PECO funds, and the age of the community college system, it seemed necessary to conduct a study of the Florida community college instructional facilities. In 1992, Carolina M. Lopez showed the older the building, the poorer its condition. She conducted this study on the Condition of Instructional Facilities in Florida Community Colleges. The results of her study showed significant findings:

> The older the building, the poorer the condition; the worse the condition of a building, a greater amount of maintenance expenses was estimated as being deferred to date; the better the condition of the building, the greater the allocation of PECO funds; the worse the condition of a building, the smaller the allocation of PECO funds; the worse the condition of a facility, a smaller percent of the general

> fund was spent on plant operation and maintenance; the worse the condition of a facility, the greater number of years was found for current age; the lesser the amount of deferred maintenance, the better the condition of the buildings; the greater the amount of deferred maintenance, the worse the condition of the buildings; the greater the percent of general fund spent on plant operation and maintenance, the better the condition of the buildings; the condition of community college instructional facilities in Florida appears to be poor when taking into consideration the newness of its facilities. (70-73)

A report compiled by the Division of Community Colleges for the Florida legislature highlighted the dire need to replicate the Lopez study. For fiscal years 1994-95 through 99-00 per F.S. 235.435 (1), the calculated amount of money for maintenance appropriations was $233,395,414. This amount should have been allocated to the community college system for facilities maintenance. The community college system only received $59,656,749 in maintenance appropriations during that period of time. The shortfall to the community college system for maintenance appropriation alone was $173,738,665. Furthermore, the community college administrators were surveyed in January 1999 to report the "critical deferred maintenance" need. The administrators reported an additional $39,628,279 as a critical need; this amount was in addition to the $173,738,665 shortfall. The total shortage was $213,366,944 (Division of Community Colleges, 1999a). Additionally, with the implementation of the ADA and the Florida Accessibility Code for Building Construction (1997), this researcher believed it necessary to measure progress towards meeting the requirements as set forth in these laws.

Definition of Terms

Adequacy refers to the capacity of the building for the current and projected student enrollment.

Americans with Disabilities Act Accessibility Guidelines (ADAAG) incorporate the laws of the Americans with Disabilities Act of 1990 as it relates to construction. There are very specific measurements provided in ADAAG that must be upheld by law (ADA, 1990).

Capital outlay and debt service (CO & DS) are trust funds established by the State under article XII of the Florida Constitution with funds derived from a portion of fees collected for automobile license tags and distributed to school districts and community colleges to finance construction of school and community college facilities and to service debts incurred by them for construction of educational facilities (Department of Education, 1990a).

Capital renewal is a systematic and cost-effective approach to planning and budgeting that extended the useful life of a facility and retained the usable condition of a facility, not normally covered in the annual operating budget. Capital renewal could include but was not limited to scheduled replacement of worn-out major building and infrastructure components or systems, retrofitting for energy conservation, elimination of health and safety problems, accessibility for persons with disabilities, and compliance with any federal, state, and/or local regulations (Kaiser, 1996).

Deferred maintenance is work that had been postponed on a planned or an unplanned basis. This usually occurred due to lack of funds in the annual budget cycle. Failure to adequately fund routine maintenance, renewal, and/or replacements could create a deferred maintenance backlog. Examples could include but were not limited to roofs, mechanical equipment, major building renovations, and repair or installation of underground utilities (Kaiser, 1996). This amount was recorded on the survey instrument as a total dollar amount per building in the sample.

Florida Accessibility Code for Building Construction (FACBC) incorporates into the laws of Florida the accessibility requirements of the Americans with Disabilities Act

(ADA) of 1990 while maintaining at the same time those provisions of Florida law that are more stringent than the ADA accessibility guidelines. The manual is a reflection of the laws of Florida, ADA accessibility guidelines, and the administrative rules of various agencies as the requirements relate to construction (FACBC, 1997).

Instructional facilities are those structures listed on the facilities inventory report provided by the Division of Community Colleges. The facilities listed were those that housed classrooms and laboratories and were permanent (Division of Community Colleges, 1998).

Maintenance funding is an allocation of money that each community college receives annually. The amount is calculated per F.S. 235.435(1), sum-of-the-digits. This money is to be utilized by the respective community college for the maintenance of its facilities (Department of Education, 1990b).

Public Education Capital Outlay (PECO) are bonds sold only by the State under the provision of Article XII of the Florida Constitution for the purpose of financing the construction of higher education facilities. The provision of money for those projects had to be approved by statutes prior to construction. The bonds were retired from the proceeds of revenue derived from gross utility receipt taxes (Department of Education, 1990b).

Replacement Cost Index (RCI) is the measure of the condition of an educational facility. It was described as the ratio of the original cost of a school facility plus the sum of all capital improvements made to that facility, divided by the estimated current replacement cost for the structure including all improvements that might be needed (Honeyman, Wood, Thompson, & Stewart, 1988).

Overview of the Methodology

The study began with a review of the relevant literature pertaining to the maintenance of facilities and the financing of the maintenance of facilities in institutions of higher education throughout the United States and more specifically, to the state of Florida. As a first step, data were obtained from the Division of Community Colleges, Bureau of Information Systems, and individual community college facilities offices pertaining to the individual facilities condition, adequacy, and accessibility. An inventory of a descriptive nature of the instructional facilities in the Florida community colleges was constructed. Data were analyzed to determine the condition and adequacy of community college instructional facilities and whether any differences existed between the condition of those facilities when compared by size category of the community college. A second step of data collection was a survey instrument. Data obtained from the survey instrument were used to analyze the difference between the RCI and deferred maintenance by adequacy and accessibility. Third, analyses of variance were conducted. They measured RCI and size, RCI when considering deferred maintenance and size; RCI and accessibility, then RCI when considering deferred maintenance and accessibility.

Population

This researcher focused on studying the condition of instructional facilities and the funding mechanism within the state of Florida only. The population for this study included all instructional facilities on campuses of the 28 community colleges in Florida during the 1997-98 academic year. A stratified systematic sample was drawn from this population for use in this study. To create the sampling strata, the 28 community colleges were classified according to the theory of classification by Stephen Katsinas (1993). This classification system broke entities into 14 distinct types. For the purposes of this research, the community colleges were grouped into three categories: small, medium, and large. After being grouped into the three categories, facilities were systematically selected from each respective strata of facilities for the purposes of this study. Therefore, a stratified systematic sample was selected from the community colleges in the state of Florida. This study allowed comparisons to be made between the current conditions of those facilities and the adequacy of the funding mechanism. Since staff members of the Florida Division of Community Colleges agreed to provide data for this study and data could be received from individual members of Florida community colleges, the Florida community college instructional facilities were selected as the population in which to conduct this study.

Data Collection

The data were collected in the following manner.

1. The researcher obtained a copy of the Facilities Inventory Report from the Florida Division of Community Colleges in order to utilize a current inventory of all community and junior college instructional facilities within the state.

2. The Facilities Director of the Bureau of Financial and Business Services, Division of Community Colleges, was contacted to obtain data on categorical budget allocations.

3. A survey instrument (Appendix A) was prepared and used to obtain information pertaining to the adequacy and accessibility of the selected instructional

facilities. The same survey instrument was used to obtain data that would enable the computation of the RCI.

Data Analysis

Data were analyzed in three different stages. In the first stage, the current condition of Florida's community college instructional facilities was determined by the computation of the RCI. A regression analysis was conducted to determine the nature and the extent of the relationship between the condition of community college facilities and age of the facility, level of deferred maintenance, and the percentage of maintenance funding for plant expenditures in Florida.

In the second stage, data obtained from the survey instrument were used to evaluate the adequacy and accessibility of community college instructional facilities and the levels of deferred maintenance. In the third stage, the data were analyzed to determine whether there were significant differences between the conditions of the community college instructional facilities when compared according to size category of the institution. Analyses of variance (ANOVA) were conducted to determine whether there were significant differences between the conditions of the facilities including levels of deferred maintenance when compared according to size category of the institution. ANOVAs were used to analyze the difference between the RCI by adequacy and accessibility and the RCI by adequacy and accessibility when using deferred maintenance.

Organization of the Study

Chapter 1 includes the introduction, purpose of the study, a broad overview of the study, delimitations and limitations, definition of terms, and an overview of the methodology. Chapter 2 contains a review of the relevant literature about the condition of facilities in public schools and higher educational institutions. It also contains a detailed definition of the RCI, funding mechanisms in the state of Florida, and information regarding accessibility guidelines in the Florida Accessibility Code for Building Construction (1997), Section 504 of the Rehabilitation Act of 1973, and the ADA (1990). Chapter 3 presents a detailed description of the methodology to be used. Chapter 4 presents an analysis of the data and relevant findings. Chapter 5 presents a summarization of the conclusions, implications, and recommendations for further research.

CHAPTER 2
REVIEW OF RELATED LITERATURE

The following review of the literature was broken into four different sections. The first section was an overview of the literature regarding the history, age, condition/adequacy, and deferred maintenance of facilities in educational institutions. The second section was a detailed definition of the RCI. The third section was a review of the funding mechanisms in the state of Florida in regard to facilities. Lastly, the fourth section was a brief presentation of information from the Florida Accessibility Code for Building Construction (1997), Section 504 the Rehabilitation Act of 1973 and the ADA (1990).

Overview of the Literature

College and university facilities deteriorate and age as time passes. Facility reinvestment across the country has not kept pace with the increasing need. Although there was an abundance of research and literature regarding public school facilities, the research regarding facilities in higher education was very limited. However, in the literature, three main issues arose regarding facilities in education. They were age of facilities, condition/adequacy of facilities, and amounts of deferred maintenance. Since many of the funding mechanisms and statutory regulations were very similar within public school education and higher education, one could extend the issues in public school facilities to the higher education facilities. Therefore, the overview of the literature documented the significant crisis regarding facilities in higher education.

Age

One of the major reasons cited in the literature for deterioration of facilities was the age of those facilities. Thirty-three percent of higher education's total physical plant were at least 30 years old, while almost 66% of higher education's total physical plant were at least 20 years or older (NACUBO, 1991). Generally, while two-year institutions had relatively small average campus size, they represented approximately 50% of all institutions of higher education in the United States (Rush & Johnson, 1989). Additionally, Kaiser (1996) reported that at least 80% of the facilities were built before 1980 and the median age of facilities at colleges and universities around the country was 28 years.

During the last 25 years of higher education, the physical plant of colleges and universities has continued to grow at an enormous rate. Between 1965 to 1970, an average of 76 new institutions were built every year. This averaged to three institutions every two weeks (Coffield & Gaither, 1976). Additionally, more college and university space was constructed between 1950 and 1975 than the previous 200 years (NACUBO, 1991).

In a report by the General Accounting Office (GAO) in 1995, the researchers attempted to cite age of the facility as a major factor in contributing to the deterioration of any facility. However, some older buildings had more sound infrastructures than newer buildings. Many buildings built in the early years of this century were built with a projected life span of 50 to 100 years. Contrarily, some more modern buildings, particularly if built after 1970, were designed with a life span of only 20 to 30 years. For example, in Chicago, three schools, all built between 1926 and 1930, were each given a different classification. One was classified as in the worst physical condition, one was classified as a typical school, and the third was classified in the best physical condition. That is an example that age was not a factor in the condition of those facilities, but maintenance was the major factor (General Accounting Office, 1995)

According to Education Writers Association (EWA) (1989), 61% of the public school buildings were constructed during the 1950s and 1960s. Contrarily, only 6% of the public school buildings were constructed during the 1980s. Overall, there was a consistent lack of data collection with the additional lack of personnel support for facilities and training of facilities personnel (Education Writers Association, 1989).

According to a joint report by the American Association of School Administrators (AASA), Council of the Great City Schools CGCS, and National School Boards Association (NSBA), 1983, it was estimated that nearly 20% of the school facilities in the older industrial cities were built before 1920. Additionally, a large portion of buildings built before 1900 were still in use. It was also reported that school facilities experienced a larger share of vandalism to individual schools, therefore costing more money for replacement or repair. Finally, it was reported that extensive costs were incurred for health and safety requirements as well as accessibility issues and regulations. Recent regulations at that time required asbestos removal, clean air regulations, and accessibility for the disabled. During the 1950s and 1960s, the emphasis was to construct the greatest amount of square footage for the least amount of money without regard for long term serviceability or long term quality. Conversely, the problems with the older facilities were in bringing them into compliance with current codes and standards and the long term wear on the facilities. As a conclusion of this report, it was reported the construction and repair needs for public schools were ranked among the most serious in the nation (AASA, CGCS, and NSBA, 1983).

Adequacy

A second major issue with the facilities in higher education was the condition or adequacy of the facilities. According to Honeyman (1990), "the magnitude of the problem is enormous and is rapidly becoming the educational issue of the 1990s. School districts across the country operate school facilities that are often unsafe, inadequate for enrollment, and inaccessible to special populations of students" (p. 247). Various reports surfaced in the literature and provided a critical look at the condition of the facilities in higher education. For example, in a joint report conducted in 1983, it was reported that "the nation's educational infrastructure is in a state of critical disrepair" (American Association of School Administrators, Council of the Great City Schools, and National School Boards Association, 1983, p. 1). Furthermore, it was reported the building experts at that time believed the schools were deteriorating at a much faster rate than they could be repaired, and much faster than most public facilities. It was reported that the schools had great difficulties in keeping up with the rapid increases in the energy prices of the 1970s.

Thompson, Wood, and Honeyman (1994) reported problems within the public schools which related significantly to unattended major repairs, overcrowding, physical unsoundness, functional obsolescence, and uncorrected environmental hazards. For example, limited resources were believed to have caused neglect of the school facilities. Sixty-one percent of schools needed major repairs and 13% were structurally unsound. Capital expenditures decreased as a percentage of total costs from 18% in 1959 to only approximately 6% in 1988. It was clear that all other aspects of education were first served before the facility needs were addressed. Thus, creating a crisis situation regarding the condition of facilities in education (Thompson, Wood, & Honeyman, 1994).

In 1989, Wolves at the Schoolhouse Door, written by the Education Writers Association (EWA), showed some startling facts. The authors reported that 25% of the school buildings were in inadequate condition, only 33% were adequate, and 42% were in good condition. Furthermore, of those buildings which were designated as inadequate, 61% were in need of major repairs, 43% were obsolete, 42% had environmental hazards, 25% were overcrowded, and 13% were found to be structurally unsound. Jonathan Kozol (1991) wrote about numerous, startling inequalities in Savage Inequalities. In numerous cities such as East St. Louis and Chicago, for example, many communities funded education in an unequal manner. Examples were cited where raw sewage was on the school grounds, where there was only one working bathroom for the children, where lead-based paint was peeling off the ceilings and the walls, and schools were at double their student capacity. Bathrooms, hallways, gymnasiums, and closets had been converted into classrooms (Kozol, 1991).

The General Accounting Office (1996) reported that on average, a new elementary school costs about $6 million to build. An average secondary school costs about $15 million to build and contains up to 150,000 square feet. Not only did facilities cost a lot of money, but also Congress and several state courts finally recognized the quality of a learning environment affected the education that a child received. Additionally, it was reported that attending school in decent facilities was crucial to the high-quality learning environment (General Accounting Office, 1996). "Decent facilities" was defined in a court case (Pauley v. Kelly, 1982) as structurally safe, containing fire safety measures, sufficient exits, an adequate and safe water supply, an adequate sewage disposal system, sufficient and sanitary toilet facilities, plumbing fixtures, adequate storage, adequate light, be in good repair and attractively painted as well as contain acoustics for noise control (Pauley v. Kelly, 1982).

In 1996, the GAO reported additional statistics regarding the number of students affected by inadequate conditions in schools. For example, the greatest percentage and number of students attending schools with at least one inadequate building was found in the central cities, which amounted to 5.6 million students. Furthermore, 50.5 percent or more were minority and 70 percent or more were students who were eligible for free or reduced-price lunch plans. Additionally, the region with the highest percentage of students affected with at least one unsatisfactory environmental condition was the West at 68 %, but the greatest concentration of students was in the South at 8.0 million students (General Accounting Office, 1996).

During the last 40 years of higher education, there has been dramatic growth in the number of students served as well. The student body has grown from an estimated 2.7 million students in the 1950s to an estimated 12.5 million students in the 1990s; this was a 400% increase (NACUBO, 1991). It was reported that there were 13.9 million students in 1995 with projections of 16.1 million students by 2007 (McClenney, 1998). In 1994, according to Kaiser (1996) higher education had about 4 billion gross square feet of campus space, up from 570 million gross square feet in 1950. Furthermore, Kaiser reported in 1950, there were about 2.3 million students. That number had grown to about 14.2 million and was expected to increase to about 16.2 million students by the year 2005 (Kaiser, 1996). While the researchers cited different estimates, one can clearly see the tremendous need for more facilities and the need for those facilities to be adequately maintained. Furthermore, rushing to keep up with the demand of this increasing student body, the quality of construction was not optimal regarding the longevity of the facility (Kaiser, 1996). Therefore, the liability of the physical plant throughout the years was quite evident (Coffield & Gaither, 1976).

Numerous stakeholders were concerned about the condition of instructional facilities in America's colleges and universities. Those stakeholders were students, staff, and faculty. Legislators should have had a deep interest in the condition of the facilities as well, due to the obligation of the state and federal governments in support of the country's goals. Colleges and universities must have up-to-date and functional facilities for effective teaching and quality research to take place (Kaiser, 1996). In fact, it was widely accepted that more learning occurred as a result of higher quality facilities. Conventional wisdom supported that the physical environment affected the behavior, achievement, and performance of students and teachers in a school building (Honeyman, 1994).

In a report issued by NACUBO (1991), it was reported that some institutions were attempting to educate students using obsolete laboratories, unusable classrooms, and inadequate libraries. All Americans want the U.S. to continue to be a world leader and this goal could come to fruition through participation with America's colleges and universities. At risk was the ability to provide quality education and to conduct research in an increasingly knowledge-based environment (Kaiser, 1996).

In 1989, a joint report was issued by the Association of Physical Plant Administrators of Universities (APPA) and Colleges and National Association of College and University Business Officers (NACUBO), in cooperation with Coopers & Lybrand which released many critical statistics regarding the condition/adequacy of facilities in higher education. The authors reported some critical statistics echoed in the literature. The condition of the country's facilities in America's colleges and universities was at a critical juncture. It was reported that operation and maintenance (O & M) expenditures had declined when compared to the overall educational and general (E & G) expenditures in the latest few decades. This decline had contributed to the crisis regarding the upkeep of the facilities at colleges and universities (Kaiser, 1996). In some of the more severe cases, the accumulated backlog of deferred maintenance could impede the core mission functions and possibly threaten the financial stability of some institutions of higher education (Kaiser, 1996).

Higher education was not the only branch of education to have a crisis regarding facilities. The nation's largest public enterprise is elementary and secondary education, which is conducted in over 80,000 schools in about 15,000 different school districts. America's public schools house over 42 million students. In 1995, a federal judge would not permit the schools in our nation's capital to open until thousands of life-threatening fire code violations were corrected. Additionally, in 1993, over 1,000 New York City schools were closed for the first 11 days of schools due to noncompliance with asbestos requirements. As a result, in February of 1995, the GAO was asked by Congress to conduct a national survey to evaluate the condition of America's schools. The results of the national sample of schools were astounding. The GAO projected that the nation's schools needed about $112 billion to repair or upgrade the facilities to good overall condition. Of this amount, it was projected that $11 billion (10%) was needed over the next 3 years to comply with federal mandates. These mandates required schools to make all programs accessible to all students, to remove or correct hazardous substances such as lead in the water or paint, asbestos, materials in underground storage tanks (UST), and radon or other requirements. At that time, it was reported that about two-thirds of America's schools were in at least adequate condition. However, the remaining one-third of schools needed extensive repair or replacement of one or more buildings. This remaining one-third housed about 14 million students. Additionally, almost 60% of America's schools surveyed reported at least one major building feature in need of extensive repair, being overhauled, or replaced. Furthermore, about half of the schools surveyed reported at least one unsatisfactory environmental condition in their schools. Examples of unsatisfactory environmental conditions were poor ventilation, heating or lighting problems, or poor physical security. Some of the features reported most frequently in need of repairs were HVAC; plumbing; roofs; finishes, exterior walls, windows, and doors; electrical lighting; electrical power; and interior trims and finishes (General Accounting Office, 1995). Within the survey done by the GAO, some actual examples were cited. One example was in Montgomery County, Alabama, where a ceiling, weakened by leaking water, collapsed 40 minutes after the children left the elementary school for the day. Another example was where raw sewage had backed up on the front lawn of a junior high school due to defective plumbing. As a last example, in a high school in Chicago, floors were buckling, and so much floor tile was loose that students could not walk in parts of the school. Furthermore, in the same school, an outside door had been chained for 3 years to prevent students from exiting through that doorway to prevent them from falling on broken outside steps. Environmental conditions were reported to be poor as well. About 50% of the surveyed schools reported at least one unsatisfactory environmental condition, and 33% reported many unsatisfactory conditions. One example was in Richmond, Virginia, where many schools closed in early September and May because the heat, very poor ventilation, and no air conditioning made the conditions unbearable. Another example was an elementary school in Chicago, where the walls and ceilings dripped with lead-based paint peelings, still contained asbestos and had several boarded-up windows. Many officials contributed the declining condition of schools to insufficient funds (General Accounting Office, 1995).

Deferred Maintenance

A third major issue to surface in the literature was funding. Large amounts of deferred maintenance had accumulated over many years, thus increasing the crisis in higher education regarding facilities. According to Wood, Thompson, Picus, and Tharpe, (1995) the financing of capital outlay was historically of little concern. In the early years of our country, schools were constructed by volunteers without consideration or thought for items like bonds, tax rates, or bond referenda. Through the early 1900s, the primary responsibility of financing the public school buildings rested with the local communities. Furthermore, as late as 1941, it was reported that only twelve states had some provisions for capital outlay and debt service (Wood, Thompson, Picus, & Tharpe, 1995).

Honeyman (1990) reported that facilities provided a particularly difficult situation for rural communities because of the extraordinarily high cost with regard to other educational expenditures (p. 248). In 1985, Honeyman and Stewart conducted a study of the rural Kansas school buildings. The study focused on districts with less than 1,000 enrollment. However, the authors reported a belief that similar maintenance needs existed in the larger districts in the state, as well. The respondents reported the total cost of needed maintenance and repair exceeded $25 million. However, the costs were projected to reach $60 million for all districts with less than 1,000 of enrollment in Kansas. It was reported as a significant deferred maintenance problem and many of the facilities would need to be repaired or replaced very soon (Honeyman & Stewart, 1985b). Furthermore, the results of another study conducted in 1988 suggested that, nationally, the cost of deferred maintenance for buildings in rural districts was approximately $2.6 billion or an estimated $38 billion nationally (Honeyman et al., 1988).

According to Education Writers Association (1989), there was an estimated $41 million backlog for maintenance and major repairs of public school buildings. The estimated replacement cost of 88,021 public school buildings was $422 billion. Additionally, it was reported that approximately 2-4% of the replacement value was to be used for annual maintenance, the EWA survey found many schools to be investing well below that amount.

According to a joint report by the AASA, CGS, and NSBA (1983), to complicate matters even farther, since 1977 state tax and expenditure limitation measures were enacted in 29 states. As a result, the pressure to reduce funding because of revenue limitations hit the maintenance and capital outlay harder than it did instruction. Therefore, expenditure limitations increased the amounts of deferred maintenance. This continued to increase the deterioration of buildings, and as costs escalated accordingly, continued to erode America's multi-billion dollar investment in its school facilities. It was reported for every $1 not invested, America's schools fell another $620 behind in repair (General Accounting Office, 1995).

There was a perception that the federal programs, state, and local mechanisms of finance were not adequate to fund the serious facilities needs of America's schools. As a result, Congress passed the Education Infrastructure Act of 1994 (General Accounting Office, 1996). At that time, Congress appropriated $100 million in the form of grants to schools for repairs, alterations, renovations, or construction. However, these funds were eliminated in 1995 by legislative efforts to balance the budget (General Accounting Office, 1996).

In 1995, the GAO reported on the role of the states in supporting improvements with school facilities. The study was conducted from October 1994 to September 1995. The results indicated that states did have a role in the construction, renovation, and major maintenance of school facilities. In fact, 13 states established a comprehensive facilities program. While as a group, the states reported providing $3.5 billion in 1994 for school facilities construction, it varied greatly. For example, it was reported that in 40 states with ongoing assistance programs, the state assistance ranged from $6 per student to more than $2,000 per student (General Accounting Office, 1995). Additionally, within the states, technical assistance and compliance review activities varied greatly as well. For example, 40 states reported facility funding on an ongoing basis, 44 states reported providing compliance review activities or technical assistance, and 23 states reported some data collection and maintenance of the information about the condition of the school facilities (General Accounting Office, 1995). Traditionally, the financing of construction of school facilities had been a responsibility of local government. During the 1950s baby boom, state participation increased. During the 1970s, the litigation highlighted disparities in various school districts' ability to raise money for public education. At that time, much of the litigation pertained to the state's role in providing instruction. However, through the years, the conditions of school facilities had become an increasing concern within the school finance litigation arena. For example, in 1994, the Arizona Supreme Court (Roosevelt Elementary School District v. Bishop) found the states school funding system unconstitutional based on disparities within the condition of its schools' facilities. Additionally, the states of Texas and Ohio have seen court challenges, which looked at the districts' ability to make capital expenditures and the importance of suitable facilities for a constitutionally acceptable system of education (General Accounting Office, 1995). Many state officials reported instances where the facility needs were much greater than available state resources. State officials reported different ways to allocate funding for facilities. Many states reported they prioritized funding towards the districts with less ability to pay. Some states reported providing aid as grants versus loans. Most states reported the funding of facilities through the state budget appropriations. Additionally, most states reported providing no assistance for routine or preventive maintenance through their respective state construction funding programs (General Accounting Office, 1995). Furthermore, there have been numerous court challenges regarding the ability of school districts to provide adequate facilities. Examples are Tennessee (Tennessee Small School Systems v. McWherter, 1995), New Jersey (Abbott v. Burke, 1988), Texas (Edgewood Independent School District v. Kirby, 1988), Missouri (Jenkins v. The State of Missouri, 1986) and West Virginia (Pauley v. Kelly, 1982). The courts found, in many cases, a more systematic way of funding was necessary to fund the replacement and renovation of outdated facilities.

According to Honeyman (1994), in the public schools around the country, millions of students attended schools in substandard facilities. Furthermore, facilities continued to deteriorate at an alarming rate. From 1951 to 1991, the state's financial aid for school construction grew substantially. It increased from $78 million in 1951 to $633 million in 1970 to $1.4 billion in 1979 and over $3 billion in 1991. Funding for school construction, while on the rise, was not fast enough. The cost of deferred maintenance has risen to $90 billion in 1993. The maintenance was so drastically deferred that one school district reported its budget capability was to repaint each school building interior once every 47 years, exterior every 29 years, and recover every floor every 39 years (Honeyman, 1994). It was reported by Honeyman (1990), numerous states had enormous amounts of unmet needs with regard to deferred maintenance and construction. For example, the Oklahoma State Department of Education estimated that $622 million was in unmet needs in 1987; North Carolina similarly had $3.2 billion in unmet needs in 1987; and lastly, evidence in Texas suggested a total of $5.4 billion would be necessary for facility projects by 1996 (Honeyman, 1990, p. 248). According to Kaiser (1996), if institutions of higher education were to attempt to replace its facilities, it would cost an estimated $300 billion (the average cost of construction of college and university facilities was about $101 per gross square foot). The cost of replacement of higher education's facilities was reported to be $200 billion in 1981 (Kaiser, 1984). Just for capital renewal and replacement needs, the colleges and universities around the country needed an estimated $60 billion. Furthermore, of that $60 billion, $20.5 billion were reported to be of urgent need. In 1988, colleges and universities deferred an estimated $3.60 of needed maintenance for every $1.00 spent. This amount had grown to $4.00 of needed maintenance for every $1.00 spent (NACUBO, 1991).

In a study of Facilities Conditions at U.S. Colleges and Universities, written by Harvey Kaiser (1996), it was suggested that it would cost at least $500 billion to replace the buildings, fixed equipment, and the infrastructure of higher education. According to Kaiser, in 1996, an estimated $6.7 billion of construction was completed in higher education. It was reported that 63% of that amount was for new construction, 14% was for additions, and 23% was for capital renewals. In the literature, a "rule of thumb" arose. It was recommended that about 1.5% to 3.0% of the replacement value of the physical plant must be reinvested every year to help maintain facilities (Kaiser, 1996). Dunn, Jr. (1989) recommended that at least 2% to 4% of the plant replacement value each year be earmarked for the upkeep of facilities. This recommendation was considered by some to be rather low. Some other industries recommended about 9% of the replacement value of the physical plant be reinvested each year (Rush & Johnson, 1989).

In 1998, it appeared that many of the states' legislatures realized the inadequate funding for replacement and repair of facilities and the crisis facing higher education regarding the maintenance of facilities. Schmidt (1998) reported approximately one third of the legislatures agreed to spend a considerably larger amount on construction and renovation of public college facilities. It was reported that some states embarked on their largest campus construction campaign ever (Schmidt, 1998).

The Replacement Cost Index

The Replacement Cost Index (RCI) was a measure of adequacy developed to evaluate the condition of facilities, developed by Honeyman and Stewart (1985a) and utilized by Burns (1990) and Lopez (1992). The RCI attempted to address the issue of historic cost versus current replacement cost ratio analysis. The original and all improvement costs were given in historic dollars while current replacement cost was the current dollar amount of the facility. "The index is the ratio of the original cost of a building plus the sum of all major additions, renovations, and other capital improvements to the building divided by its estimated replacement cost" (Honeyman, Wood, Thompson,

& Stewart, 1988, p. 233). The formula was presented as follows (Honeyman, Wood, Thompson, & Stewart, 1988):

$$RCI = \frac{OC + \sum_1 \ldots I_n}{CRC}$$

Where OC = original cost,
I = the improvements from 1 to n,
CRC = the current replacement cost.

Honeyman et al. (1988) theorized that a high value (close to 1) for the computed index for a facility indicated that the value of the structure had been maintained (through repairs and renovations) over the course of time. However, a low computed index indicated neglect, underfunding of needed repairs, maintenance, or improvements. By using the index, one can make comparisons of the relative condition of facilities throughout the community colleges within the study.

Funding

In a study conducted by Agron (1997), the research findings concluded that a total of $202,100,772 was spent on construction at two-year colleges in 1996 alone. This construction included new schools (n=27), additions to existing schools (n=19), and major modernizations or retrofitting projects (n=51). Furthermore, the projected amount of construction to be completed between 1997-1999 was $537,773,002. Of this amount, $395,775,952 was projected for new schools (n=50), $38,814,550 for addition to existing schools (n=17) and $103,182,500 for major modernization or retrofitting projects (n=51).

The primary source of funds for facilities at community colleges in the state of Florida was provided for in Section 9(a)(2) and Section 9(d) of Article XII of the State Constitution. Under this provision, entitled the Public Education Bond Amendment

(PEBA), the proceeds received from the gross receipts taxes for utility services were placed in the PECO and Debt Service trust fund. The revenues, interest, and any proceeds received from the public education capital outlay bonds issued by the state Board of Education were then used to finance capital outlay projects for the state system of public education as authorized by the Legislature. Historically, the funds accrued under this section were referred to PECO. Additionally, in a GAO (1996) report, it was reported that in the state of Florida, for fiscal year 1993/94, state revenue per student for K-12 education was $2,979. In contrast, in the state of Florida for the same fiscal year, state spending for school facilities per student for k-12 education was $290. Furthermore, it was reported that 85% of schools surveyed in Florida reported a need to upgrade or repair facilities to good overall condition (General Accounting Office, 1996, p. 65). Annually, the Legislature allocated funds from the PECO and Dept Service Trust fund appropriation to various boards of the state system of public education. The PECO money was divided between the k-12 system, the community college system, and the state university system (SUS) with the following respective percentages: 70%, 15%, and 15%. Ron Fahs reported of the PECO money the public schools received about 55%, the community colleges received 24% and the universities received 22% (personal correspondence, 1999). In accordance with Section F.S. 235.41, the Commissioner of Education submitted a comprehensive capital outlay budget request on behalf of all the boards to the Legislature. Furthermore, annually, pursuant with Section F.S. 235.435 (1)(a), each College Board of trustees received an allocation for remodeling, renovation, maintenance and repairs for existing facilities. This amount of money was calculated using the Sum-of-the-Years Digit formula as written in the statute.

While the procedure was firmly in place, it was not a guarantee that enough money would be generated to fund the expressed needs of each community college. For fiscal years 1994-95 through 99-00, there had been a shortfall of funding in the maintenance appropriation alone in the amount of $173,738,665 (Division of Community Colleges, 1999a). Additionally, with regard to Section F.S. 235.435 (4)(a), the boards' of trustees also received funds for projects based on a three-year priority list for the entire state community college system included in the legislative budget request submitted by the Commissioner of Education. Also, under the School Capital Outlay Amendment, Section 9(d), Article XII, State Constitution, as amended, the proceeds of revenues received from the licensing of motor vehicles were placed in the Capital Outlay Bonds and Debt services fund to be distributed annually to the school districts and college districts in relation to the number of instructional units within each district (Department of Education, 1990b). If the College Board of trustees adopted a resolution to request the issuance of capital outlay bonds against revenues accruing within the college district, then the State Board of Education could issue bonds on behalf of that district. These funds were commonly referred to as capital outlay and debt service (CO & DS). Money from revenues, interest, and proceeds from the sale of capital outlay bonds was also used to finance capital projects in the order of priority of need expressed in a current educational plant survey at a respective community college (Department of Education, 1990a).

The Americans with Disabilities Act/Florida Accessibility Code for Building Construction

In 1973, Section 504 of the Rehabilitation Act was the federal law enacted to mandate accessibility standards for persons with disabilities. Any institution that received federal funds had to comply with that law. In 1993, the Florida Legislature enacted the "Florida Americans with Disability Accessibility Implementation Act." The purpose and intent of this act was to incorporate the laws of the Americans with Disabilities Act (1990) into the Florida Accessibility standards to ensure the most stringent accessibility guidelines available for the citizens of Florida. In 1997, the legislature amended the Act to establish consistency to the Florida accessibility building code to the Federal ADA Accessibility Guidelines as adopted by the Department of Justice at 28 CFR part 36, Appendix A (Florida Accessibility Code for Building construction, 1997). Numerous codes have evolved over the years regarding physical accessibility for persons with disabilities. By far, the Florida Accessibility Code for Building Construction (1997) and the ADA (1990) were the most far reaching with many financial implications for institutions of higher education in the state of Florida. Since many facilities were built under the auspices of earlier codes, the physical layout of facilities could remain as long as the programs and services were accessible to individuals with disabilities (Americans with Disabilities Act, 1990). However, once an institution conducted any major repairs or renovations, the building had to comply with the current code in effect, which would have been the Florida Accessibility Code for Building Construction (FACBC) and/or the ADA. Therefore, institutions of higher education could incur expensive renovation costs to comply with ADA and FACBC. Kaiser (1996) reported that on average, $4 million per institution was estimated to achieve full compliance. In order to achieve overall full compliance, it was believed that nearly $9 billion would need to be spent. About 12% of the colleges and universities needed to spend about $10 million or more to come into compliance with ADA (Kaiser, 1996). Of the school district facilities modernized in 1996, 42.4% were for retrofitting of facilities on ADA compliance. Furthermore, of the two-year schools, 50.3% reported upgrading facilities for ADA compliance (Agron, 1997).

Summary

The review of the literature regarding the maintenance of facilities in America's colleges, public schools and universities clearly showed a crisis. The facilities were not maintained and the deterioration was connected to the age of the facilities, the condition/adequacy of the facilities, and the large amounts of deferred maintenance.

The RCI was originally developed to evaluate the condition of facilities at public schools. A high value for the computed index for a building indicated that the value of the structure had been maintained over time through repairs and renovations while a low computed index indicated neglect, inability to fund needed repair, maintenance or needed improvement.

In Florida, funding for new construction or renovations and repairs was provided through Article XII of the State Constitution. Under this provision, entitled the Public Education Bond Amendment, the proceeds received from the gross receipt taxes for utility services were placed in the Public Education Capital Outlay and Debt Service Trust fund. Through this fund the money was allocated on the basis of need, based on the educational plant survey as established by each community college around the state.

Based on a study conducted in 1992 by Carolina M. Lopez, the results of her study showed a correlation between the age and the condition of the facility, the amount of deferred maintenance and the condition of the facility, as well as other results. Finally, the condition of community college instructional facilities in Florida appeared to be poor when taking into consideration the newness of its facilities.

The ADA and the Florida Accessibility Code for Building Construction had far reaching financial and legal implications for community colleges in the state of Florida. These two laws required that physical facilities were accessible to persons with disabilities. In conducting renovations and repairs, the administrators at community colleges had to ensure that the facilities met the requirements as put forth in the laws.

CHAPTER 3
METHODOLOGY

The contents of this chapter are a description of the procedures that were used in this study. The subsections are population and sample, instrumentation, data collection, and data analysis.

Introduction

The purpose of this study was to identify the condition of Florida's community college instructional facilities and to determine the relationship between the condition of those facilities and age of the facility, level of deferred maintenance, and the percentage of maintenance funding for plant expenditures in Florida. Furthermore, this study was used to determine whether or not differences existed among the condition of those facilities and their levels of deferred maintenance when compared according to the size category of the institution. A further purpose was to determine whether differences existed among the condition of the facilities with regard to adequacy and accessibility. The following research questions were raised:

1. Are there relationships among the conditions of community college instructional facilities and age of the facility, level of deferred maintenance, and the percentage of maintenance funding for plant expenditures in Florida?

2. Are there differences in the conditions of community college instructional facilities when compared by size category of the college?

3. Are there differences in the conditions of community college instructional facilities when compared by size category of the college and adjusted for levels of deferred maintenance?

4. Are there differences between the conditions of community college instructional facilities for accessibility to the facility in terms of complying with the ADA Accessibility Guidelines and the Florida Accessibility Code for Building Construction?

5. Are there differences between the conditions of community college instructional facilities for accessibility to the facility in terms of complying with the ADA Accessibility Guidelines and the Florida Accessibility Code for Building Construction, when adjusted for levels of deferred maintenance?

6. Are there differences between the conditions of community college instructional facilities when compared for adequacy of the facilities for current and future enrollment?

7. Are there differences between the conditions of community college instructional facilities when compared for adequacy of the facilities for current and future enrollment and adjusted for levels of deferred maintenance?

Population and Sample

The population for this study included all instructional facilities on campuses of the 28 community colleges in Florida during the 1997-98 academic year. A stratified systematic sample was selected from this population for use in this study.

To create the sampling strata, the 28 community colleges were classified according to the theory behind the classification system created by Stephen Katsinas (1993). This system divided community colleges into 14 distinct types. For the purposes of this research, the community colleges in the state of Florida were categorized into only three distinct types. Those types were small, medium, and large community colleges. The size categories were established by grouping the 28 community colleges into the three categories. Each category accounted for 33% of the 28 community colleges therefore creating three categories. Following closely to those criteria, it was found that there were 9 small, 9 medium, and 10 large community colleges. The total headcount enrollment per community college reported for the fall of 1997-98 was taken into consideration. The range of total headcount enrollment per group was set using 0 to 14,500 for the small category, 14,501 to 23,000 for the medium category, and over 23,000 for the large category.

The permanent, instructional facilities were the only facilities considered in this study. Only facilities which were permanent facilities under sole ownership and usage by the community colleges were used in this study. This researcher did not use any facilities which were temporary, leased, or joint use facilities.

A total of 579 buildings comprised the entire population of the instructional facilities for the community colleges in the state of Florida. Using the facilities inventory report, as provided by an official with the Division of Community Colleges (1998), the 579 buildings were grouped into the three aforementioned categories based on the size, small, medium, large, of the community college where the buildings were found. A description of the population is shown in Table 3-1.

Table 3-1.
Grouping of Community Colleges and Buildings in the Sample

Size	Community College Name	97/98 Total Enrollment Headcount	Total Number of Instructional Buildings	Total Number of Instructional Buildings Surveyed
Small	North Florida	2,868	12	4
	Florida Keys	4,410	8	3
	Lake-Sumter	6,055	10	3
	St. Johns River	6,827	14	4
	Chipola	6,851	14	4
	Lake-City	7,193	20	7
	South Florida	8,672	16	6
	Pasco-Hernando	10,403	18	6
	Okaloosa-Walton	14,388	20	7
		subtotal	132	44
Medium	Central Florida	14,895	20	6
	Manatee	16,074	23	8
	Polk	18,011	8	3
	Tallahassee	18,088	15	5
	Santa Fe	20,140	21	7
	Edison	20,748	23	8
	Pensacola	21,918	22	7
	Seminole	22,354	14	5
	Gulf Coast	22,839	13	4
		subtotal	159	53
Large	Brevard	27,658	26	6
	Daytona Beach.	31,171	29	7
	Hillsborough	34,902	22	5
	St. Petersburg	43,438	31	8
	Broward	43,757	31	8
	Palm Beach	44,185	35	9
	Indian River	44,366	20	5
	Valencia	48,029	31	8
	Florida CC Jack.	75,099	30	8
	Miami-Dade	97,793	33	8
		subtotal	288	72
		total	579	169

The targeted sample was 29% (169 buildings) of the total population (579 buildings). The stratified systematic sample contained 169 buildings. Forty-four buildings were systematically selected from the small category, 53 buildings from the medium category, and 72 buildings from the large category. For the small community college category every third building was selected; for the medium community college category every third building was selected; and for the large community college category every fourth building was selected.

Instrumentation

Information, which pertained to funding of the community colleges, was obtained through literature and reports by the Division of Community Colleges. The information, which pertained to the individual buildings, was obtained through the use of a survey instrument. The survey instrument was adapted from previous studies by Honeyman, Wood, Thompson, and Stewart (1988), Burns (1990), and Lopez (1992). The survey instrument was validated as a survey instrument in a study conducted by Carolina M. Lopez in 1992. The survey instrument used in that study was reviewed by a panel of experts. These experts had recognized experience in the fields of higher education administration, educational facilities, and higher education finance. Recommendations for revisions from the expert panel were incorporated into the final draft before it was mailed to the selected sample identified in that study.

Data collected through the use of this survey instrument included descriptive information about the buildings selected for study in this sample. The requested building data included the following items.

1. Cost of original construction;

2. Cost of maintenance, repairs, and renovations to the building;

3. Adequacy of the building for current enrollment;

4. Accessibility to the building in terms of: adequate routes to accessible entrances for the disabled, accessible entrances for the disabled, and accessible restroom(s) for the disabled; and

5. Estimated dollar amount of deferred maintenance and the replacement cost of the building.

Data Collection

The survey instruments were mailed to the Office of the President at each community college. The contents of the mailings contained a cover letter addressed to the individual who would be completing the survey at the respective community college, a survey instrument per facility selected and a self-addressed stamped envelope for the return response.

Data Analysis

The research questions were translated into seven null Hypotheses. Each null hypothesis was tested independently with a 0.05 level of significance.

Null Hypotheses

Ho1 - There are no relationships among the conditions of community college instructional facilities and age of the facility, level of deferred maintenance, and the percentage of maintenance funding for plant expenditures in Florida.

Ho2 - There are no differences in the conditions of community college instructional facilities when compared by the size category of the community college.

Ho3 - There are no differences in the conditions of community college instructional facilities when compared by size category of the college and adjusted for levels of deferred maintenance.

Ho4 - There are no differences between the conditions of community college instructional facilities for accessibility to the facility in terms of complying with the ADA Accessibility Guidelines and the Florida Accessibility Code for Building Construction.

Ho5 - There are no differences between the conditions of community college instructional facilities for accessibility to the facility in terms of complying with the ADA Accessibility Guidelines and the Florida Accessibility Code for Building Construction, when adjusted for levels of deferred maintenance.

Ho6 - There are no differences between the conditions of community college instructional facilities when compared for adequacy of the facilities for current and future enrollment.

Ho7 - There are no differences between the conditions of community college instructional facilities when compared for adequacy of the facilities for current and future enrollment, and adjusted for levels of deferred maintenance.

Method of Analysis

Null Hypothesis Ho1 dealt with the relationship between the condition of community college instructional facilities as measured by the Replacement Cost Index (RCI) and age of the facility, level of deferred maintenance, and the percentage of maintenance funding for plant expenditures in Florida. The percentage of the state budget allocations for maintenance as a part of the operating budget was computed for each college in the sample. The RCI was computed for each building in the sample. A regression analysis was applied using the RCI as the dependent variable. The percentage of maintenance funding, building age and deferred maintenance were entered as independent variables. The regression analysis was selected to test the null hypothesis because the variables were continuous. The analysis includes calculation of the regression equation, partial correlations, the regression and residual sums of squares, and the F ratios.

Null Hypothesis Ho2 dealt with the differences in the conditions of community college instructional facilities when compared by size category of the college. An analysis of variance was performed to test if significant differences existed between the RCIs. An ANOVA test was chosen to test this hypothesis because it allowed the comparison of three groups (small, medium, large) simultaneously.

Null Hypothesis Ho3 dealt with the differences in the conditions of community college instructional facilities when compared by size category of the college and adjusted for levels of deferred maintenance. An analysis of variance was applied to test whether significant differences existed between the RCIs according to the size category of the college.

Null Hypothesis Ho4 dealt with differences between the conditions of community college instructional facilities for accessibility to the facility in terms of complying with the ADA Accessibility Guidelines and the Florida Accessibility Code for Building Construction. One question in the survey instrument, with four subparts, was used to conduct four analyses of variance to test if significant differences existed between the RCIs when compared for reported accessibility for each subpart.

Null Hypothesis Ho5-Ho7 dealt with differences between the conditions of community college instructional facilities when compared by reported adequacy for enrollment and accessibility taken separately, with and without deferred maintenance factored into the equation. The adequacy and accessibility responses were reported in a YES - NO format. Analyses of variance (ANOVAs) were used to test if significant differences existed between the RCIs when compared by reported adequacy and reported accessibility, with and without deferred maintenance.

Summary

The population for this study included all instructional facilities on campuses of the 28 community colleges in Florida during the 1997-98 academic year. The community colleges were grouped according to the theory behind the classification system created by Katsinas (1993), and a stratified systematic sample was selected from the sampling strata of community colleges. The information pertaining to the funding of community colleges and budget allocations was received from reports provided by the Division of Community Colleges. A survey instrument, which had been previously validated, was used in order to collect descriptive information about the buildings selected in the sample. One survey instrument per building was mailed to the office of the president at each of the respective community colleges where the buildings were located. Seven null hypotheses were developed to test the research questions. A parametric statistical analysis was used to test each null hypothesis. A regression analysis was run to test the first hypothesis. Analyses of variance were used to test the remaining six hypotheses.

CHAPTER 4
ANALYSIS OF DATA

Introduction

The purpose of this study was to identify the condition of Florida's community college instructional facilities and to determine the relationship between the condition of those facilities and age of the facility; level of deferred maintenance, and the percentage of maintenance funding for plant expenditures in Florida. Furthermore, this study was used to determine whether differences existed among the condition of those facilities and their levels of deferred maintenance when compared according to the size category of the institution. A further purpose was to determine whether differences existed among the condition of the facilities with regard to adequacy and accessibility.

1. Are there relationships among the conditions of community college instructional facilities and age of the facility, level of deferred maintenance, and the percentage of maintenance funding for plant expenditures in Florida?

2. Are there differences in the conditions of community college instructional facilities when compared by size category of the college?

3. Are there differences in the conditions of community college instructional facilities when compared by size category of the college and adjusted for levels of deferred maintenance?

4. Are there differences between the conditions of community college instructional facilities for accessibility to the facility in terms of complying with the Americans with

Disabilities Act (ADA) Accessibility Guidelines and the Florida Accessibility Code for Building Construction?

5. Are there differences between the conditions of community college instructional facilities for accessibility to the facility in terms of complying with the Americans with Disabilities Act (ADA) Accessibility Guidelines and the Florida Accessibility Code for Building Construction, when adjusted for levels of deferred maintenance?

6. Are there differences between the conditions of community college instructional facilities when compared for adequacy of the facilities for current and future enrollment?

7. Are there differences between the conditions of community college instructional facilities when compared for adequacy of the facilities for current and future enrollment and adjusted for levels of deferred maintenance?

Descriptive Profiles of the Florida Community Colleges

The target sample surveyed was 169 buildings within the three sampling strata, within the 28 Florida community colleges. Twenty of the 28 community colleges returned the survey instruments. Community college officials returned the surveys on 97 buildings. Of those 97 surveys returned, 30 were in the small category which was a 68% return rate, 34 were in the medium category which was a 64% return rate, and 33 were in the large category which was a 46% return rate. The overall return rate was 57.4%. Table 4-1 lists N (number), the mean and the standard deviation for the variable related to funding in the Florida community college system general fund for maintenance. The statewide mean value for maintenance appropriation for 1997-98 was $275,284. The mean value for maintenance appropriation ranged from $116,416 for the small category to $434,491 for the large category.

Table 4-1
Descriptive Profile of the Florida Community College Instructional Facilities

Description Maintenance Appropriation 1997-98	N	Mean	Standard Deviation
Total statewide	97	$275,284	$166,073
Small	30	116,416	49,048
Medium	34	260,937	105,481
Large	33	434,491	138,083

Table 4-2 lists the N, the mean, and the standard deviation for each variable related to the instructional buildings surveyed. The variables related to the instructional buildings were the age of the facilities, the cost of original construction, the current replacement cost, repairs and renovations, deferred maintenance, and the gross square footage.

The mean value for the age of the buildings was 20 years. The mean values for age according to size category were 18, 19, and 21 for the small, medium, and large, respectively. The mean value for the cost of original construction was $1,770,701. The mean values for the cost of original construction according to size category were $1,255,142, $1,420,100, and $2,600,618 for small, medium, and large, respectively. The mean value for the current replacement cost was $3,570,272. The mean values for the current replacement cost according to size category were $2,252,407, $3,903,467, and $4,425,039 for small, medium, and large, respectively. The mean value for the amount of repairs and renovations was $632,757. The mean values for the amount of repairs and

Table 4-2
Descriptive Profiles of the Florida Community Colleges Instructional Facilities

Description	N	Mean	Standard Deviation
Age of building (years)			
Total (statewide)	97	20	12
Small	30	18	12
Medium	34	19	10
Large	33	21	14
Cost of Original Construction			
Total (statewide)	97	$1,770,701	$2,139,586
Small	30	1,255,142	1,849,673
Medium	34	1,420,100	1,612,226
Large	33	2,600,618	2,619,611
Current Replacement Cost			
Total (statewide)	97	$3,570,272	$3,002,690
Small	30	2,252,407	2,202,403
Medium	34	3,903,467	2,940,437
Large	33	4,425,039	3,352,105
Repairs and Renovations			
Total (statewide)	97	$632,757	$911,769
Small	30	528,917	725,919
Medium	34	1,066,461	1,245,633
Large	33	280,310	279,739

Table 4-2--continued

Description	N	Mean	Standard Deviation
Deferred maintenance			
Total (statewide)	97	$524,781	$884,953
Small	30	228,595	371,079
Medium	34	506,918	727,218
Large	33	812,446	1,229,366
Gross Square Footage			
Total (statewide)	97	27,802	24,225
Small	30	17,401	15,030
Medium	34	29,062	22,415
Large	33	35,959	29,428

renovations according to size category were $528,917, $1,066,461, and $280,310 for small, medium, and large, respectively. The mean value for the amount of deferred maintenance was $524,781. The mean values for the amount of deferred maintenance according to size category were $228,595, $506,918, and $812,446 for small, medium, and large, respectively. Lastly, the mean value for the gross square footage was 27,802. The mean values for the gross square footage according to size category were 17,401, 29,062, and 35,959 for small, medium, and large, respectively.

Table 4-3 presents the N, mean, and the standard deviation for the computed measures assessing the conditions of the instructional facilities in the sample. All of the values are listed statewide as well as by size category.

Table 4-3
Condition of the Florida Community Colleges Instructional Facilities

Description	N	Mean	Standard Deviation
	Replacement Cost Index (RCI)		
Total (statewide)	97	.69	.26
Small	30	.78	.24
Medium	34	.68	.27
Large	33	.61	.25
	Replacement Cost Index with Deferred Maintenance		
Total (statewide)	97	.89	.52
Small	30	.92	.38
Medium	34	.94	.77
Large	33	.82	.28

The mean value for RCI was .69. The mean values for the RCI according to size category were .78, .68, and .61 for small, medium, and large, respectively. The mean value for the RCI with deferred maintenance was .89. The mean values for the RCI with deferred maintenance according to size category were .92, .94, and .82 for small, medium, and large, respectively.

Results of the Tests of the Null Hypotheses

This study addressed the seven research questions that were formulated into null hypotheses. A statement regarding what was addressed by each research question, its corresponding null hypothesis and an explanation of the statistical analysis follows.

The first question addressed the relationship among the conditions of community college instructional facilities and age of the facility, level of deferred maintenance, and the percentage of maintenance funding for plant expenditures for Florida. A null hypothesis was developed to test the first research question.

Ho1 – There are no relationships among the conditions of community college instructional facilities and age of the facility, level of deferred maintenance, and the percentage of maintenance funding allocated for plant expenditures in Florida.

In order to test the first null hypothesis, a regression analysis was used. The independent variables were the age of the buildings, the percentage of maintenance funding budgeted, and the amount of deferred maintenance. Using the regression coefficients with the t-values and the p-values, the results are reported in Table 4-4.

The independent variable of deferred maintenance had a t-value of -.460 and a p-value of .646, which was not statistically significant. The independent variable of age had a t-value of –1.548 and a p-value of .1249, which is not statistically significant at a 0.05 level. One of the three independent variables tested to be statistically significant. The independent variable of the maintenance percentage had a t-value of 11.248 and a p-value of <.0001, which is statistically significant at a 0.05 level. A direct relationship existed between the percentage of maintenance funding budgeted and the current condition of the buildings as measured by the RCI. This would indicate that a lower percentage of maintenance funding allocated was related to a lower RCI value, also indicating the worse the expected condition of the buildings. Likewise, a higher percentage of maintenance funding allocated was related to a higher RCI value.

Table 4-4
Multiple Regression

RCI with 3 Independents

	Coefficients	Std. Error	Std. Coeff.	T-value	p-value
Deferred maint	-1.77	3.85	-.060	-.460	.646
Age	-.005	.003	-.214	-1.548	.1249
Maint%	72.268	6.425	.841	11.248	<.0001

The second question addressed the differences in the conditions of community college instructional facilities when compared by size category of the college. A null hypothesis was developed to test the second question. The summary is presented in Table 4-5.

Ho2 – There are no differences in the conditions of community college instructional facilities when compared by the size category of the community college. In order to test the second null hypothesis an analysis of variance was used. The analysis of variance compared the means of the RCI for small, medium and large community colleges.

The results as reported in ANOVA table 4-5 listed an F-value of 3.317 and a p-value of .0405, which is statistically significant at a 0.05 level. Additionally, the Scheffe post hoc test, when comparing group 1 with group 3, showed a p-value of .0415 with a mean difference of .166, which is also statistically significant. Therefore, on the basis of this finding null hypothesis two was rejected. There was a significant difference between the condition of community college instructional facilities when compared by the size category of the community college. The mean RCI for small community colleges was .78 and the mean RCI for large community colleges was .61. This resulted in a mean difference of .166, which was significant.

Table 4-5
ANOVA Table for RCI vs. size

	DF	Sum of Squares	Mean Square	F-value	p-value
Size	2	.435	.218	3.317	.0405
Residual	94	6.167	.066		

Scheffe for RCI, effect: size, significance level: 5%

	Mean Diff.	Crit. Diff.	P-value
Group 1, group 2	.099	.160	.3101
Group 1, group 3	.166	.161	.0415
Group 2, group 3	.067	.156	.5655

The third research question addressed the differences in the conditions of community college instructional facilities when compared by size category of the college and adjusted for levels of deferred maintenance. A null hypothesis was developed to test the third research question. The summary of analysis of variance is presented in Table 4-6.

Ho3 – There are no differences in the conditions of community college instructional facilities when compared by size category of the college and adjusted for levels of deferred maintenance. In order to test the third hypothesis an analysis of variance was used. The analysis of variance compared the means of the RCI with deferred maintenance for small, medium and large community colleges.

The results as reported in ANOVA table 4-6 for RCI with deferred maintenance compared to size of the college reported F-value of .512 and a p-value of .6011, which is not statistically significant. Therefore, based on these findings null hypothesis three failed to be rejected. There appear to be no significant differences between the conditions of community college instructional facilities when compared by size category of the college and adjusted for levels of deferred maintenance.

Table 4-6
ANOVA table with RCIdef vs. size

	DF	Sum of Squares	Mean Square	F-value	p-value
Size	2	.283	.141	.512	.6011
Residual	94	25.975	.276		

A fourth research question addressed the differences between the conditions of community college instructional facilities for accessibility to the facility in terms of complying with the ADA Accessibility Guidelines and the Florida Accessibility Code for Building Construction. A null hypothesis was developed to test the fourth research question.

Ho4 – There are no differences between the conditions of community college instructional facilities for accessibility to the facility in terms of complying with the ADA Accessibility Guidelines and the Florida Accessibility Code for Building Construction.

In order to test null hypothesis Ho4, four analyses of variance were conducted. The survey instrument had one question (#6) with four different parts (a-d) to evaluate this null hypothesis. For each of the questions 6a through 6d, an analysis of variance was conducted. The summary of the analyses of variance is reported in Table 4-7.

The results as reported in ANOVA table 4-7 for question 6a in the survey instrument, which addressed accessible entrances to the instructional facilities, listed an F-value of 3.364 and a p-value of .0698, which is not statistically significant.

Table 4-7
ANOVA Table for Entrances

	DF	Sum of Squares	Mean Square	F-value	p-value
Entrances	1	.226	.226	3.364	.0698
Residual	95	6.376	.067		

The results as reported in ANOVA table 4-8 for question 6b in the survey instrument, which addressed adequate routes to accessible entrances to the instructional facilities, listed an F-value of .070 and a p-value of .7913. This finding is not statistically significant.

Table 4-8
ANOVA Table for Routes

	DF	Sum of Squares	Mean Square	F-value	p-value
Routes	1	.005	.005	.070	.7913
Residual	95	6.597	.069		

The results as reported in ANOVA table 4-9 for question 6c in the survey instrument, which addressed accessible restrooms for disabled men, listed an F-value of 10.628 and a p-value of .0015, which is statistically significant. This means that for the group who reported they had accessible men's restrooms, the RCI was .737. The RCI for those reporting they did not have accessible restrooms was .545, which was a mean difference of .192, and this difference was significant.

Table 4-9
ANOVA Table for Men's Restrooms

	DF	Sum of Squares	Mean Square	F-value	p-value
Men's Restrooms	1	.664	.664	10.628	.0015
Residual	95	5.938	.063		

The results as reported in ANOVA table 4-10 for question 6d in the survey instrument, which addressed accessible restrooms for disabled women, listed an F-value of 10.628 and a p-value of .0015, which is statistically significant. This means that for the group who reported they had accessible women's restrooms, the RCI was .737. The RCI for the group who did not have accessible women's restrooms was .545.

Table 4-10
ANOVA Table for Women's Restrooms

	DF	Sum of Squares	Mean Square	F-value	p-value
Women's Restrooms	1	.664	.664	10.628	.0015
Residual	95	5.938	.063		

Therefore, when comparing the conditions of community college instructional facilities for accessibility to the facility, as reported by questions 6a through 6d, there were significant differences. Therefore, based on these findings, null hypothesis four is rejected. There are significant differences between the conditions of community college instructional facilities for accessibility to the facility in terms of complying with the ADA Accessibility Guidelines and the Florida Accessibility Code for Building Construction.

A fifth research question addressed the differences between the conditions of community college instructional facilities for accessibility to the facility in terms of complying with the ADA Accessibility Guidelines and the Florida Accessibility Code for Building Construction, when adjusted for levels of deferred maintenance. A null hypothesis was created to test the fifth research question.

Ho5 – There are no differences between the conditions of community college instructional facilities for accessibility to the facility in terms of complying with the ADA Accessibility Guidelines and the Florida Accessibility Code for Building Construction, when adjusted for levels of deferred maintenance.

Four analyses of variance were used to test this null hypothesis. The survey instrument had one question (6) with four different parts (a-d) to evaluate this null hypothesis. For each of the questions 6a through 6d, an analysis of variance was conducted. The summary of the analyses of variance is in Table 4-11.

The results as reported in ANOVA table 4-11 for question 6a in the survey instrument, which addressed accessible entrances to the instructional facilities, listed an F-value of 10.885 and a p-value of .0014, which is statistically significant. This means for the group who reported having accessible entrances, the RCI with deferred maintenance was .828. For those who reported they did not have accessible entrances, the RCI with deferred maintenance was 1.318. Therefore, if deferred maintenance was included, it made a significant difference for those institutions who reported they did not have accessible entrances.

Table 4-11
ANOVA Tables with Deferred Maintenance for Entrances

	DF	Sum of Squares	Mean Square	f-value	p-value
Entrances	1	2.699	2.699	10.885	.0014
Residual	95	23.558	.248		

The results as reported in ANOVA table 4-12 for question 6b in the survey instrument, which addressed adequate routes to accessible entrances to the instructional facilities, listed an F-value of .485 and a p-value of .4878. This finding is not statistically significant.

Table 4-12
ANOVA Table with Deferred Maintenance for Routes

	DF	Sum of Squares	Mean Square	f-value	p-value
Accessibility	1	.133	.133	.485	.4878
Residual	95	26.124	.275		

The results as reported in ANOVA table 4-13 for question 6c in the survey instrument, which addressed accessible restrooms for disabled men, listed an F-value of 2.704 and a p-value of .1034. This finding is not statistically significant.

Table 4-13
ANOVA Table with Deferred Maintenance for Men's Restrooms

	DF	Sum of Squares	Mean Square	f-value	p-value
Men's Restrooms	1	.727	.727	2.704	.1034
Residual	95	25.531	.269		

The results as reported in ANOVA table 4-14 for question 6d in the survey instrument, which addressed accessible restrooms for disabled women, listed an F-value of

2.704 and a p-value of .1034, which is not significant. Based on the results of these findings, null hypothesis five is rejected. There are significant differences between the conditions of community college instructional facilities for accessibility to the facility in terms of complying with the ADA Accessibility Guidelines and the Florida Accessibility Code for Building Construction, when adjusted for levels of deferred maintenance.

Table 4-14
ANOVA Table with Deferred Maintenance for Women's Restrooms

	DF	Sum of Squares	Mean Square	f-value	p-value
Women's Restrooms	1	.727	.727	2.704	.1034
Residual	95	25.531	.269		

A sixth research question addressed the differences between the conditions of community college instructional facilities when compared for adequacy of the facilities for current and future enrollment. A null hypothesis was developed to test the sixth research question. The summary of the results is presented in Table 4-15.

Ho6 – There are no differences between the conditions of community college instructional facilities when compared for adequacy of the facilities for current and future enrollment. In order to test the sixth null hypothesis an analysis of variance was used.

The results as reported in ANOVA table 4-15 listed an F-value of 6.887 and a p-value of .0101, which is statistically significant. Based on these findings, null hypothesis six was rejected. There are significant differences between the conditions of community colleges instructional facilities when compared for adequacy of the facilities for current and future enrollment. The mean RCI for the group who reported themselves as adequate for current and future enrollment was .737. The mean RCI for the group who reported themselves as not adequate for current and future enrollment was .593, which was a mean difference of .144, and this difference was significant.

Table 4-15
ANOVA Table for RCI and Adequacy

	DF	Sum of Squares	Mean Square	F-value	p-value
Adequacy	1	.446	.446	6.887	.0101
Residual	95	6.156	.065		

A seventh research question addressed the differences between the conditions of community college instructional facilities when compared for adequacy of the facilities for current and future enrollment, when adjusted for levels of deferred maintenance. A null hypothesis was developed to test the seventh research question. The summary of the results is in Table 4-16.

Ho7 – There are no differences between the conditions of community college instructional facilities when compared for adequacy of the facilities for current and future enrollment, when adjusted for levels of deferred maintenance. In order to test the seventh null hypothesis an analysis of variance was used.

The results as reported in ANOVA table 4-16 listed an F-value of 2.164 and a p-value of .1446, which is not statistically significant at a 0.05 level. Based on these results, null hypothesis seven fails to be rejected.

Table 4-16
ANOVA Table for RCIdef and Adequacy

	DF	Sum of Squares	Mean Squares	F-value	p-value
Adequacy	1	.585	.585	2.164	.1446
Residual	95	25.673	.270		

CHAPTER 5
SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS FOR FURTHER RESEARCH

Introduction

The purpose of this study was to identify the condition of Florida's community college instructional facilities and to determine the relationship between the condition of those facilities and the age of the facility, the level of deferred maintenance, and the percentage of maintenance funding for plant expenditures in Florida. Furthermore, this study was used to determine whether differences existed among the condition of those facilities and their levels of deferred maintenance when compared according to size category of the institution. A further purpose was to determine whether differences existed among the condition of the facilities with regard to adequacy and accessibility. The results of this study determined what kind of relationships existed between the condition of those facilities and age of the facility, level of deferred maintenance, and the percentage of maintenance funding for plant expenditures in Florida. Additionally, this study was used to determine whether differences existed among the condition of those facilities and the levels of deferred maintenance when compared according to the size category of the institution with adequacy and accessibility.

As a result of a review of the literature, research questions were created.

1. Are there relationships among the conditions of community college instructional facilities and age of the facility, level of deferred maintenance, and the percentage of maintenance funding for plant expenditures in Florida?
2. Are there differences in the conditions of community college instructional facilities when compared by size category of the college?
3. Are there differences in the conditions of community college instructional facilities when compared by size category of the college and adjusted for levels of deferred maintenance?
4. Are there differences between the conditions of community college instructional facilities for accessibility to the facility in terms of complying with the Americans with Disabilities Act (ADA) Accessibility Guidelines and the Florida Accessibility Code for Building Construction?
5. Are there differences between the conditions of community college instructional facilities for accessibility to the facility in terms of complying with the Americans with Disabilities Act (ADA) Accessibility Guidelines and the Florida Accessibility Code for Building Construction (FACBC), when adjusted for levels of deferred maintenance?
6. Are there differences between the conditions of community college instructional facilities when compared for adequacy of the facilities for current and future enrollment?
7. Are there differences between the conditions of community college instructional facilities when compared for adequacy of the facilities for current and future enrollment and adjusted for levels of deferred maintenance?

Seven null hypotheses were developed to test the posed research questions. A regression analysis was utilized to test the first null hypothesis. Analyses of variance were used to test the remaining six null hypotheses. The results of these tests indicated the relationships and the differences between each of the variables as stated in the research questions.

Data Collection and Analyses

Data were obtained from the Division of Community Colleges. The population for this study included all instructional facilities on campuses of the 28 community colleges in Florida during the 1997-98 academic year. A stratified systematic sample was selected from this population. The 28 community colleges were classified into three categories: small, medium and large. Survey instruments were sent to all 28 community colleges. The surveys were sent to collect information on 169 buildings. The responses were from 20 community colleges, which totaled 97 buildings. The collection of these data enabled the researcher to collect an inventory of a descriptive nature on the Florida community college instructional facilities.

The current condition of each facility was calculated using the computation of the replacement cost index (RCI). A regression analysis was conducted to test the first null hypothesis using three independent variables and a dependent variable. Next, ANOVAs were conducted to test the remaining six null hypotheses. For null hypotheses two and three, ANOVAs were conducted using the size categories and the survey data. This determined if there were differences in the conditions of community college instructional facilities, as measured by the RCI and the RCI plus deferred maintenance, according to the size category of the institution. For null hypotheses four and five, ANOVAs were conducted using questions e6-9 of the survey data. This determined if there were differences between the conditions of community college instructional facilities, as measured by the RCI and the RCI plus deferred maintenance, for accessibility. Finally, for null hypotheses six and seven, ANOVAs were conducted using the results of the survey data (question 1d). This determined if there were significant differences between the conditions of community college instructional facilities, as measured by the RCI and the RCI plus deferred maintenance, for adequacy of the facilities for current and future enrollment.

Conclusions

It is possible to conclude that the larger the percentage of maintenance funding for plant expenditures the better the expected condition of the facility. The findings of this study indicated a direct relationship with the current condition of the community college instructional facilities and the percentage of maintenance funding for plant expenditures in Florida ($\underline{p} = <.001$). However, the percent of maintenance funding in community college budgets has continued to decline. In recent years, money for deferred maintenance was calculated as outlined in F.S. 235.435(1), which mandated funds to be earmarked for the maintenance of facilities. This amount of money has not been fully funded for at least 6 years. Such underfunding has resulted in increasing levels of deferred maintenance.

Instructional facilities at small community colleges were in better condition than instructional facilities at the large community colleges. The findings of this study indicated a significant difference in the condition of community college instructional facilities when compared by the size of the community college ($\underline{p} = .0405$). The Scheffe post hoc test showed a mean difference of .166 between small and large colleges. The mean RCI for the small community colleges was .780 and the mean RCI for large community colleges was .614. Such a situation might be explained since smaller community colleges had fewer facilities to maintain. It is possible that with fewer facilities and fewer campuses, the smaller community colleges were more cognizant of the maintenance needs. The RCI can be used to predict the condition of instructional facilities in Florida's community colleges.

There was a significant difference in the condition of community college instruction facilities and accessibility to restrooms and entrances. The findings of this study indicated a significant difference between the condition of community college instructional facilities, as measured by the RCI, for levels of accessibility to the facilities. The group that reported having accessible restrooms had a mean RCI of .737. The group that reported not having accessible restrooms had a mean RCI of .545, the mean difference was .192, which was significant. The findings of this study indicated a significant difference between the condition of the community college instructional facilities when compared by accessibility to those facilities adjusted for deferred maintenance ($\underline{p} = .0014$). Agron (1997) reported of the 2-year schools, 50.3% reported upgrading facilities for ADA compliance. While Agron (1997) reported that some 2-year schools were upgrading facilities toward compliance, the results of this research indicate that some Florida community colleges have not improved accessibility over the years. One possible problem could be the lack of money. Kaiser (1996) reported about 12% of the colleges and universities needed to spend about $10 million or more to come into compliance with ADA. Community colleges have become increasingly aware of inadequate accessibility, yet have not been able to adjust to the new requirements. Additionally, with the implementation of the laws, unless a major repair or renovation is done, facilities only have to meet old standards that allow for much less accessibility. This situation could be explained by the effects of the ADA legislation on accessibility of community college facilities. There is a need to monitor for compliance and provide funding to assist community colleges in compliance with the ADA and FACBC. Additionally, there may be a need to earmark money and provide technical assistance for the purpose of retrofitting instructional facilities to comply with ADA requirements. If one can assume the large community colleges do not properly maintain the facilities and if poorly maintained facilities have less accessibility, a possible result may be that large community college facilities are not accessible.

The findings of this study indicated a significant difference between the conditions of community college instructional facilities when compared for adequacy of the facilities for current and future enrollment ($\underline{p} = .0101$). The mean RCI for the group who reported as adequate for current and future enrollment was .737. The mean RCI for the group who reported as not adequate for current and future enrollment was .593, a mean difference of .144, which is significant. Differences in the RCI could explain situations where poorer conditions do exist in certain facilities.

Implications

Kaiser (1996) reported an expected increase in students across the nation to 16.2 million by the year 2005. Rushing to keep up with this demand of increasing students, the quality of construction was not optimal regarding the longevity of the facility (Kaiser, 1996). Perhaps this conclusion shows that there is not enough space for the rapidly growing student body (Kaiser, 1996). Policymakers should review the adequacy of the community college instructional facilities. The definition of adequacy could be broadened to include the adequacy to handle the technological needs of the 21st century. As stated in the results of this study, many community college instructional facilities do not have the capacity to house the current and projected student enrollments.

This study was only the second study evaluating the condition of the community college instructional facilities in Florida. The conclusions and implications should be used to review and evaluate issues such as deferred maintenance, the amount of money allocated annually for maintenance, the age of the instructional facilities, and the accessibility and adequacy of those facilities. The conclusions of this study indicate that there is a need to evaluate the funding mechanism for the maintenance of facilities, accessibility, and adequacy in the state of Florida. There should be a review of these results to implement changes in policy to protect the facilities in Florida's community colleges. If an unfunded mandate has resulted in higher levels of deferred maintenance, which has resulted in poorer conditions of facilities, legislative policymakers should revise current policy to guarantee funding. The RCI and levels of deferred maintenance were shown as ways to measure the condition of facilities. Using these data, officials should review the allocations at respective community colleges to ensure parity between various size categories of community colleges. While the formula to fund the maintenance of facilities was based on gross square footage and need, perhaps large community colleges have a greater need based on deterioration. There is a need to investigate this situation and possibly fund large community colleges accordingly.

Community college instructional facilities that are in poorer condition also have less accessibility. Since large community colleges had lower RCIs and were in poorer condition, the large community colleges were shown to be less accessible. The accessibility could be correlated to the condition of the facilities. The current flat funding formula does not appear to assist large community colleges. Legislators should review the unfunded mandate and investigate implementing an accessibility component into the funding formula.

Adequacy was correlated with a higher RCI; therefore, those institutions with a lower RCI were less adequate. The large community colleges had a lower RCI and, one could conclude, were less adequate. Policymakers may need to review the funding formula for adequacy for future enrollment.

In the state of Florida, the condition of instructional facilities remains a concern as a result of unfunded mandates. Legislators should review the formulas used to fund these mandates. Additionally, legislators should review the revenue generating mechanisms as they currently exist. The legislature needs to discuss alternative methods to allocate funds for the maintenance of existing facilities.

Recommendations for Further Research

The following items are recommended for further research.

1. Further study is recommended regarding the allocation of funds from the Florida Legislature for maintenance of community college facilities. The different percentages of funding spent from the PECO funds should be tracked. The funding for facilities upkeep is mandated through Florida Statute, however, that statutory amount has not been fully funded by the Legislature for at least 6 years. Therefore, extensive study should be conducted in that regard.

2. A study of current amounts of deferred maintenance and the amounts of deferred maintenance over the years could help determine a manageable cap for the

Florida community colleges. As a result of such a study, Florida community colleges should keep the amount of deferred maintenance at a respective institution no higher than a set amount.

3. Research should be conducted regarding the RCI of the respective plants around the state of Florida and the impact of implementing a set percentage of expenditures for maintaining facilities.

4. Additional research should be conducted regarding the accessibility of the community college facilities and the expenditures for retrofitting facilities.

5. Additional research should be conducted regarding the adequacy of the instructional facilities. The adequacy component could be measured by the capacity of the facilities to house the numbers of students, the construction standards, and/or the capabilities for technology in the instructional facilities.

6. Further study is recommended to review the relationship between the RCI and repairs/renovations or deferred maintenance/gross square feet to predict the condition of a building. If one looked at a 1-year fiscal snapshot of the expenditures of community colleges by size category, one might get a different conclusion. If one divided the mean amount of repairs/renovations by the mean amount of gross square footage, by size category, one could get an amount per foot; these calculations could confirm or reject the relationship between size of the community college and expenditures/square footage for repair/renovations.

Similar calculations could be performed using deferred maintenance levels. Again, these calculations could confirm or refute the relationship between size of community college and expenditures/square footage for deferred maintenance. It is recommended that a researcher investigate this method to prove if these results are an alternative method to determine the condition of the facilities.

APPENDIX A
BUILDING SURVEY SPRING 1999

1) Name of Building:

(a. Person Completing Form:
(Optional)____

(b. Cost of Original Construction: $________________________

(c. Approximate Cost of all Major improvements, renovations, and/or maintenance expenses made on this Building (since it was built): $________________________

(d. Is this building adequate for current enrollment:

YES NO

(e. Please evaluate accessibility to building in terms of the following:

6. Does this building have entrances accessible for the disabled:
YES NO
7. Does this building have adequate routes to these entrances:
YES NO
8. Does this building have accessible restrooms for disabled men:
YES NO
9. Does this building have accessible restrooms for disabled women:
YES NO

(a. Estimate the value of needed repairs and renovations which have been deferred to date: $________________________

(b. Estimate the current replacement cost for this building: $________________________

Adequacy refers to the capacity of the building for the current and projected student enrollments.

Accessibility will be evaluated in terms of meeting the Americans with Disabilities Act Accessibility guidelines (ADAAG) for buildings and facilities; proposed rule.

APPENDIX B
COVER LETTER

University of Florida, Institute of Higher Education
Dr. Dale Campbell, Dr. David S. Honeyman, and Brenda Fettrow
PO Box 117049
Gainesville, Fl. 32611

March 13, 1999 INFORMED CONSENT FOR PARTICIPATION IN RESEARCH

I am a doctoral candidate at the University of Florida, under the supervision of Dr. David Honeyman. I am conducting a study to identify the condition of Florida's community college instructional facilities and to determine the relationship between the condition of those facilities and the budget allocations for capital outlay, maintenance and debt service.

I am requesting your participation in this research project. Enclosed are several survey forms to complete, one for each building selected at your college. These buildings have been randomly selected from the Division of Community Colleges' facilities inventory report.

Your privacy will be protected. All data will be kept confidential to the extent provided by law. You do not have to answer any question you do not wish to answer. There is no anticipated risk, direct benefit, nor compensation for participation. Questions or concerns about the research participants' rights can be directed to the UFIRB office, Box 112250, University of Florida, Gainesville, Fl. 32611-2250. Please answer to the best of your ability, estimating where necessary. However, you are free to withdraw your consent and to discontinue participation in the project at any time without prejudice. The survey instrument should only take a few minutes of your time. If you need additional information, I can be reached at (407) 632-1111, ext. 63483 (suncom 361-3483) or home (407) 632-5891.

The results of this study will be very useful in the future financing of community college facilities in the state of Florida. An executive summary of the results will be sent to you at the completion of the study. Please return the surveys by March 26, 1999. Thank you very much for your prompt assistance.

I have read the procedure described above. I voluntarily agree to participate in the procedure and I have received a copy of this description.

____
Participant signature date

__________________	__________________	________________
Dr. David S. Honeyman	Dr. Dale Campbell	principal investigator
Enclosure		(Brenda Fettrow)

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BIOGRAPHICAL SKETCH

Brenda Fettrow currently works at Brevard Community College as the Dean of Student Development for the Cocoa campus. As dean, she supervises admissions/records advisement, the Learning Lab, and minority recruitment/retention. Prior to assuming those duties, she was the Director of the Office for Students with Disabilities for nine years at Brevard Community College. As director, she supervised all college-wide programs and accessibility for students with disabilities. She created a television show with the local WBCC regarding programs and services for students with disabilities. She has extensive knowledge and experience with upholding the accessibility guidelines as put forth in the Americans with Disabilities Act. She went through two intensive on-site team visits by the Office for Civil Rights out of Atlanta, Georgia. She is a member (1997-98) of the "Task Force to Evaluate the Needs of Students with Disabilities." She was selected by the Division of Community Colleges for the "Task Force to Evaluate the Needs of Students with Disabilities." She is a member of the Ad Hoc Task Force on a Budget Model Development for the Florida Community College system. She was selected the Brevard-FACC chapter "Administrator of the Year." She was the 1996 winner of the James L. Wattenbarger Community College Leaders Award. Brenda was inducted into her high school sports Hall of Fame in 1990. She currently serves on several boards of directors for nonprofit agencies. She has a Bachelor of Science degree in psychology from Longwood College in Farmville, Virginia. She has a Master of Arts degree in counseling from Rollins College in Winter Park, Florida.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

David Honeyman

David S. Honeyman, Chair
Professor of Educational Leadership, Policy
and Foundations

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

R. Craig Wood
Professor of Educational Leadership, Policy
and Foundations

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

Phillip A. Clark

Phillip A. Clark
Professor of Educational Leadership, Policy
and Foundations

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

M. David Miller

M. David Miller
Professor of Educational Psychology

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Education.

December 1999

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